

Research on the condition of small rivers in the middle taiga of the northwestern federal district in areas of continuous harvesting activities.

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Abstract: Harvesting is extremely destructive for the environment and, in especially, for the large number of water bodies located in the woodlands. The resource-intensive problem of monitoring the conditions of small rivers requires the development of environmental management tools using advanced methods. The involvement of automated systems and data processing models is designed to increase the efficiency of forest management. But the implementation of new monitoring methods requires extensive research, to find unified criteria. In the summer of 2020 a study was carried out in the forestry, located in the middle taiga. The object of the study was nine different small rivers and streams, which differ in the degree of influence of anthropogenic factors on them. The subject of the study was to determine the impact of logging and forestry road infrastructure on the accumulation of pollutants in the bottom sediments of small rivers and in coastal soils. To test it, the null hypothesis was accepted that harvesting leads to an increase of heavy metals in the soil and as a consequence chemical components are washed into the rivers, after which heavy metals accumulate in the bottom sediments. Chemical analysis of water, bottom sediments and aquatic vegetation was carried out. According to the results of studies in water samples taken from the studied objects no exceedances of nitrates and ammonia nitrogen content were found, despite active biological processes in the biotopes of the rivers. The studied objects differed in the duration, volume, and age of the effect of harvesting on the surrounding territories. There was no correlation between the age of logging and the content of heavy metals in the bottom ground. Also, no correlation was established between the content of heavy metals in shore soil and bottom sediments. No confident conclusions can be drawn from such a small sample, a much larger data set is required to accurately test the hypothesis. The measurements carried out did not reveal any deviations from the standards for this region. This work does not provide definitive answers to the research questions, but it is the first step in preparing a system for monitoring the condition of small rivers in forested areas. For a complete result, it is necessary to conduct an all-season study of a larger number of criteria on a representative sample of water bodies.